

ABSTRACT OF THE DISCLOSURE

A apparatus and method for inner ear implants is provided that generates signal processing stochastic independence activity across the excited neural population. A high rate pulse train can produce random spike patterns in auditory nerve fibers (hereafter "pseudospontaneous activity") that are statistically similar to those produced by spontaneous activity in the normal auditory nerve. We call this activity "pseudospontaneous". Varying rates of pseudospontaneous activity can be created by varying the intensity of a fixed amplitude, high rate pulse train stimulus, e.g., 5000 pps. The high rate pulse train can desynchronize the nerve fiber population and can be combined with a data signal in an inner ear implant. The pseudospontaneous activity can enhance neural representation of temporal detail and dynamic range with an inner ear implant such as a cochlear implant. The pseudospontaneous activity can further eliminate a major difference between acoustic- and electrical-derived hearing percepts.